DECISION SCIENCES INSTITUTE
Effects of different service dimensions on airline quality rankings

(Full Paper Submission)

Praowpan Tansitpong
Mahidol University International College (MUIC), Nakhonpathom-73170, Thailand.
praowpan@gmail.com

H. Muge Yayla-Kullu
Lally School of Management, Rensselaer Polytechnic Institute, Troy, NY
yaylah@rpi.edu

ABSTRACT

We study how airline quality rankings are affected by the airlines’ performance on different service dimensions. For airlines, not only there are multiple aspects of the service but also they offer differentiated services for multiple customer segments. We take such service product lines into account in our analysis and investigate economy and business classes and their impact on the overall rankings separately. We find that fast response to customer requests, high cabin presence, good quality in-flight products, and well-designed check-in operations are significant service dimensions that influence better airline rankings.

KEYWORDS: Airlines, Service Operations, Service Quality, Marketing-Operations Interface

INTRODUCTION

When it comes to choosing what product or service to buy, customers compare quality of different options by using personal experience, their physical appearances, and looking for an award or a certificate to guarantee the quality. For example, tangible products can be easily compared by physical attributes. On the other hand, services are intangible in nature and subject to customer’s own perception. Thus, building the value of service through better perception becomes crucial for the firm. One method for firms is to seek third-party awards and certify their product’s performance and attract attention. Winning an award promotes positive perceptions even when customers themselves have no experience with the products or services. For example, using Zagat rating for restaurants, customers choose to go to top-rank restaurants because they believe that they will be served with high-quality food and services. Higher ranks refer to better overall quality compared to the lower ranks. However, we note that while single number rankings give an overall idea to the customer, they do not provide information on the details of the product or the service. There are many different aspects of services that can be rated independently. At this point, firms and customers should be interested in understanding how each dimension relates to the overall ranking. Some aspects may become determining factors for the overall ranking. Equipped with such knowledge, the firm may focus on those significantly important aspects and improves its rankings which lead to an increase in its overall image in the eyes of the customers.

In this paper we focus on the airline industry which provides a service that has both tangible (such as seat comfort, meals, magazines, etc.) and intangible (such as flight attendant efficiency, responding to request, attitude, etc.) aspects. The industry is highly competitive and passengers have many options to choose from. Skytrax, a third-party assessor based in U.K
provides a ranking scheme that is endorsed by all major airlines around the world. Skytrax ranks airlines into stars representing their best quality in serving passengers. For example, ANA, Asiana, Cathay Pacific, Hainan, Malaysia, Qatar, and Singapore Airlines are ranked as the highest-5 stars in 2013 (Skytrax, 2014), others are ranked in 4-stars and 3-stars. Airlines keep tracking their awards and publicize their award by using tools such as advertisements, website, and social media (Travelworldnews\(^1\), 2014). In the same yearly ranking report, Skytrax also incorporates detailed airline service scores (such as ratings for check-in, transfer, arrival, seat comfort, quality of meals, lounge, washrooms, cabin cleanliness, enthusiasm and attitude of staff, friendliness and hospitality, etc.) on their website (airlinequality.com). These detailed scores are reported separately for first, business and economy class. Each year, more than 100 detailed service items is published for each airline. Detailed item scores may be different from the overall ranking of the airline. Some items could have higher or lower scores compared to the overall ranking. According to Travel and Leisure magazine\(^2\), Eva and Korean Air are known for inflight meals, Cathay Pacific and Virgin America are known for personal entertainments, Korean air promotes their brand new lie-flat bed seats, or Virgin Atlantic puts a futuristic-design of their mini-lounge onboard. These specific aspects may play important roles in determining the overall ranking for a particular airline. Hence, in this study, we seek to identify “the major aspects of the service that are significant in predicting the airline’s overall ranking?”

Airlines offer multiple classes with different types of services. The first or business classes not only have bigger seat sizes and more legroom, but passengers also experience better quality service such as dedicated check-in lines, club lounges, priority boarding, and premium food and beverages. These customers choose premium products because they are willing to pay more in exchange of such better service. In both manufacturing and service firms, one of the reasons why firms offer premium products is not only to increase demand to the high-end market, but it can also increase the demand at the low end market. High quality products will increase customer recognition, satisfaction, as well as build attachment and loyalty (Randall, et al., 1998; Villas-Boas 2004ab; Keller and Lehmans, 2006; Stahl, et al., 2011). Firms with premium product(s) were found to enjoy the benefit of utilizing brand extension strategies and a spillover effect under the umbrella brand (Randall, et al., 1998; Sullivan, 1998; Tepeci, 1999; Van Osselaer and Alba, 2000; Erdem and Sun, 2002; Hoeffler and Keller, 2003; Anand and Shachar, 2004; Gurhan-canli, 2003). Airlines design different products and services for premium (first and business) and economy classes. Each detailed attribute (for premium and lower quality) may have different influence on how customers perceive the overall image. For example, an airline may put personal inflight entertainment units for all economy class seats that improve their onboard experience. Even the inflight entertainment screens are smaller in economy class seats compared to business class seats, but this attributes may overshadow and improve customer perception in the overall flight experience. On the other hand, some airlines (such as Emirates) advertise their brand by using an image of their brand new first class suites with a spa bathroom on Airbus 380. This advertisement is used to convey a message of their luxurious services for both premium and economy classes. Hence, this study further seeks to identify “whether individual attributes of the premium and economy classes have different impact on the airline’s overall ranking”.

The rest of this paper is organized as follows. In the next section, we review the literature. Methods, data, and variables are explained in section 3. Section 4 presents the data collection and analysis method. We discuss the results and present important managerial insights in Section 5. Our conclusions are provided in the final section.

\(^{1}\) http://travelworldnews.com/category/airlinenews/

\(^{2}\) http://www.travelandleisure.com/articles/worlds-best-airlines
LITERATURE REVIEW

Airline service operations quality is widely measured using conformance quality due to availability of airline data via US Department of Transportation. These quality measures include number of on-time arrivals, denied boardings, mishandled baggage, and customer complaints (Bitner et al., 1990; Bejou et al., 1996; Lapre and Scudder, 2006; Tsikritskis, 2007). Researchers compile this data and ranks are given to airlines based on the total scores (Bowen and Headley, 1999-2009). Note that all these measures focus only on the dissatisfaction of customers rather than the true quality of service.

On the other hand, marketing field defines service quality as a subjective perception of the service (Garvin, 1984; Gronroos, 1984). Measurement of service quality (SERVQUAL) is developed by Parasuraman et al. (1988), using five dimensions of tangibles, reliability, responsiveness, assurance, and empathy. The measure has been used widely in services to assess customer satisfaction (Parasuraman et al., 1988; Brensinger and Lambert, 1990; Cronin and Taylor, 1992; Babakus and Boller, 1992; Headley and Miller, 1993; Anderson et al., 1994; Smith and Chan, 1996). Gourdin (1988), Elliott and Roach (1993), Ostrowski et al. (1993), and Truitt and Haynes (1994) have studied airline services using SERVQUAL and categorized airline service quality dimensions in terms of price, safety, timeliness, food and beverage, seat comfort, or check-in process. Passenger experience is found to be related to the airline image (Park et al., 2004; 2006; Zins, 2001; Gilbert and Wong, 2002). Service quality and loyalty leads to positive image and preference in choosing the airline (Ostrowki et al., 1993), emotional stereotypes (Zins, 2001), and attention to buy (Park et al., 2006) over others.

We note that airline image was conventionally measured through survey questions from individual customers. For example, questions include "I believe that this airline has a better image than its competitors"; "In my opinion, this airline has a good image in the minds of passengers"; "Overall, how satisfied are you with the airlines service quality?" (Park et al., 2001). Since Gronroos (1984) suggests that individual satisfaction is identified by the gaps between perception and expectation, individual customer comments cannot capture the actual performance of the airline. Each individual may come from different backgrounds with varying comparative standards, and expecting different outcomes. Hence, in order to compare international firms like airlines we need to find alternative measures that are free of respondent bias and utilize information that has fair comparative ranking standards. Skytrax is one such data source where all firms’ evaluations are based on same set of expectations. Hence, we use this data to eliminate the respondent bias that exists in earlier studies.

Another aspect of airlines is the differentiated classes of service offered in their product lines. First, business, premium economy, and economy are common cabin types that exist in most flights. Literature suggests that equity of premium products generated by word of mouth and advertising encourages customers to come back, and generates more customers through referral (Randall et. al., 1998; Sullivan, 1998; Tepeci, 1999; Erdem and Sun, 2002; Hoeffler and Keller, 2003; Anand and Shachar, 2004). This exposure to the products would bring more customers to the whole market. We see that the previous findings in airline service quality not only ignored the actual interaction between airlines and customers and delivery performance in terms of airline services (including many intangible dimensions), but also disregarded quality of the service measured by classes of airlines (business and economy). The exception would be a study by An and Noh (2009), they examined six service quality factors with different measurements between prestige and economy class using survey data from Korean passengers. Their results suggest that the airline differentiates their strategies due to customers’ recognition based on demographic background which affects their expectations. Hence, in this study, we incorporate an objective measure with comparable standards from
respondents and determine how each quality attribute (for both premium and low-quality services) impacts the overall image of the airline.

HYPOTHESES AND CONCEPTUAL FRAMEWORK

While an airline may have high overall rankings, it may not achieve high quality on all service dimensions. Hence, in this study, we incorporate objective quality measures and determine how each service dimension (for both business and economy classes) impacts the overall ranking of the airline.

Earlier studies have found that brand image is associated with physical attributes and non-physical attributes of products or service requirements (Keller, 1993). If an airline is able to provide better service in all those aspects (such as check-in, transfer, arrival, seat comfort, quality of meals, lounge, washrooms, cabin cleanliness, enthusiasm and attitude of staff, friendliness and hospitality flight attendant efficiency, responding to request, etc.), these dimensions will have a positive impact on the overall image. Hence, the first group of hypotheses is as follows:

Hypothesis 1a: Good quality service in all dimensions in the economy class increases an airline’s overall ranking.
Hypothesis 1b: Good quality service in all dimensions in the economy class increases an airline’s overall ranking.

We are also interested in the individual ranking of a particular class of airline service (economy and business classes) and how each class impacts the overall ranking of the airline. An airline may be providing excellent business class service but ignoring their service in the economy class. We would like to see if this kind of scenario has an adverse effect on the overall rankings. Here we propose two sets of hypotheses relating to this impact. Following set of hypotheses addresses the relationship between service dimensions within a class and their impact on the class ranking. The final set of hypotheses addresses the relationship between a class ranking and the overall ranking.

Hypothesis 2a: Good quality service in all dimensions in the economy class increases an airline’s economy class ranking.
Hypothesis 2b: Good quality service in all dimensions in the business class increases an airline’s business class ranking.

Hypothesis 3a: An increase in an airline’s economy class ranking predicts an increase in the overall ranking.
Hypothesis 3b: An increase in an airline’s economy class ranking predicts an increase in the overall ranking.

METHODOLOGY

We use Skytrax rankings data and airlines’ official annual reports to conduct our analysis.

Dependent variables: overall ranking and class rankings
Skytrax publishes detailed quality analysis and the data is publicly available (www.airlinequality.com). The rankings data used in this study are the star awards of year 2009. Star awards are granted by Skytrax in a scale of 5 stars. We collected the scores for 119 economy class and 87 business class airlines.
Independent variables: service quality dimensions
The detailed quality items carry information of an airline’s airport operations, onboard products, and employees. Each class have their own list of services and ratings. We use 15 service items (both economy and business) that relates to employees (staff responding to customer request, staff service efficiency, staff attitude, staff ability on language skills, cabin presence through flight, and staff assisting children), tangibles (seat comfort, meals, newspapers and magazines, blankets and pillows, inflight-entertainment system), and airport operations (check-in, transfer and arrival service). For business class, lounge service and lounge staff dimensions are also included.

Control variables

Assets and number of employees
Firm size influences mode of selection; larger firms prefer full-control of adding more services than smaller firms (Brouthers and Brouthers, 2001). Larger firms typically bring better resource in terms of funding which can be applied to quality of services. In order to avoid influence of firm size, we control for airline total assets. Note that, for international airlines, we convert their currency into US Dollars for a correct comparison. Apart from financial evidence of firm size, we also approach a control of size of the firm through number of employees. We collect both data for the year 2009 from airlines’ annual reports which are publicly available in their official websites.

Number of lounges
In premium service, Business class passengers are provided with higher level of services. One differentiation in service between economy and business classes is the passenger lounges. Airlines invest money to build luxury lounges to attract premium travelers and create higher satisfaction. An acquisition in number of lounge provided in the airport may influence the overall service quality. We use number of lounges each airline provides to control for the impact of premium quality in the overall market.

Number of operated years and number of countries served
Firms improve their operations as they mature in their respective markets. The longer they operate in a market, the more they learn and are able to improve their services. In order to capture such an impact of firm experience, we collect two variables associated with firm exposure to market; number of years of operations and number of countries served. Global competition is a fact of the airline industry and number of destinations could influence airlines to get exposed to a bigger market, and help improve services for a broader audience.

ANALYSIS AND RESULTS
We utilize an OLS regression analysis to identify the impact of individual service dimensions on the overall ranking (H1a and H1b), on the individual class ranking (H2a and H2b), and the relationship between class rankings and the overall ranking (H3a and H3b). We use heteroskedasticity-robust formulas for the standard errors of the regression coefficient estimators and check for multicollinearity.

In Table3.1, impact of each service dimension on overall ranking is shown in models 1a and 1b. For economy class service items (model 1a), our results suggest that cabin presence has a positive significant coefficient (0.242). Blankets/pillows and magazines/newspapers provided for economy class passengers also indicates an improvement of the overall rankings
(significant coefficient of 0.141∗ and 0.345∗∗∗). Check-in service at the airport is also positive significant (0.306∗). Our results also show negative significant items: service efficiency and safety standards have a negatively significant impact on the overall rankings. These might be due to the regulations and working environment pressure that relate to worsen the image perception.

For business class (model 1b), our results suggest that only magazines/newspaper and lounge service improve overall ranking of the airline with positive significant coefficients of 0.362∗ and 0.320∗.

For class rankings (models 2a and 2b), magazines and check-in service are positive significant and arrival services are negative significant for economy rankings. Staff responding to requests has a positive significant effect on the business rankings.

Interestingly, an investigation of mediation effect of individual ranking on overall ranking reveals that economy and business rankings have additional positive impact on the overall rankings (models 3a and 3b). The direct effect of economy ranking on overall ranking is 0.460∗∗∗ and direct effect of business ranking on overall ranking is 0.452∗∗.

The OLS regression results found that among 15 different service dimensions, the most important factors to determine the overall rankings are cabin presence, blankets, magazines, and check-in service, and lounges. Interestingly, some items are worsening the image of the airline such as safety standards. In addition, this study also investigates concept of brand equity and spillover effect of the premium brand image, the results suggest that business ranking improves overall image through mediation effect.

Table 1 OLS Regression on impact of service items on overall and individual image

<table>
<thead>
<tr>
<th></th>
<th>(1a) Overall Image (Economy Dimensions)</th>
<th>(1b) Overall Image (Business Dimensions)</th>
<th>(2a) Economy Rank</th>
<th>(2b) Business Rank</th>
<th>(3a) Overall Image (Economy Rank)</th>
<th>(3b) Overall Image (Business Rank)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Language skills</td>
<td>0.036 (0.0845)</td>
<td>0.215 (0.105)</td>
<td>-0.016 (0.0705)</td>
<td>-0.166 (0.0741)</td>
<td>0.043 (0.0707)</td>
<td>0.290 (0.104)</td>
</tr>
<tr>
<td>Responding request</td>
<td>0.114 (0.0918)</td>
<td>0.012 (0.119)</td>
<td>0.131 (0.0802)</td>
<td>0.347∗∗ (0.0739)</td>
<td>0.054 (0.0792)</td>
<td>-0.145 (0.119)</td>
</tr>
<tr>
<td>Assisting Children</td>
<td>0.108 (0.0757)</td>
<td>0.129 (0.102)</td>
<td>0.120 (0.0701)</td>
<td>-0.057 (0.0790)</td>
<td>0.053 (0.0540)</td>
<td>0.155 (0.0924)</td>
</tr>
<tr>
<td>Cabin Presence</td>
<td>0.242∗ (0.0944)</td>
<td>0.028 (0.128)</td>
<td>0.058 (0.0715)</td>
<td>0.051 (0.120)</td>
<td>0.216∗∗ (0.0758)</td>
<td>0.005 (0.108)</td>
</tr>
<tr>
<td>Service Efficiency</td>
<td>-0.179∗ (0.0653)</td>
<td>0.241 (0.110)</td>
<td>0.007 (0.0518)</td>
<td>0.128 (0.0886)</td>
<td>-0.182∗∗ (0.0599)</td>
<td>0.184 (0.0990)</td>
</tr>
<tr>
<td>Seat</td>
<td>-0.035 (0.114)</td>
<td>-0.085 (0.123)</td>
<td>0.154 (0.113)</td>
<td>0.127 (0.0919)</td>
<td>-0.106 (0.0934)</td>
<td>-0.142 (0.131)</td>
</tr>
<tr>
<td>Comfort</td>
<td>0.045 (0.0881)</td>
<td>0.025 (0.132)</td>
<td>0.160 (0.0763)</td>
<td>0.099 (0.121)</td>
<td>-0.029 (0.0772)</td>
<td>-0.070 (0.113)</td>
</tr>
<tr>
<td>Meals</td>
<td>0.067 (0.0403)</td>
<td>0.106 (0.0662)</td>
<td>0.053 (0.0413)</td>
<td>0.092 (0.0530)</td>
<td>0.043 (0.0359)</td>
<td>0.064 (0.0567)</td>
</tr>
<tr>
<td>Inflight Entertain</td>
<td>0.067 (0.0403)</td>
<td>0.106 (0.0662)</td>
<td>0.053 (0.0413)</td>
<td>0.092 (0.0530)</td>
<td>0.043 (0.0359)</td>
<td>0.064 (0.0567)</td>
</tr>
<tr>
<td>Blanket</td>
<td>0.141 (0.0663)</td>
<td>-0.118 (0.119)</td>
<td>0.000 (0.0637)</td>
<td>0.085 (0.112)</td>
<td>0.141 (0.0603)</td>
<td>-0.156 (0.0574)</td>
</tr>
<tr>
<td>Pillow</td>
<td>0.345∗∗∗ (0.0751)</td>
<td>0.362∗∗ (0.122)</td>
<td>0.207∗ (0.0607)</td>
<td>0.179 (0.0775)</td>
<td>0.250∗∗∗ (0.0665)</td>
<td>0.281∗∗ (0.120)</td>
</tr>
<tr>
<td>Magazines Newspaper</td>
<td>0.345∗∗ (0.0751)</td>
<td>0.362∗∗ (0.122)</td>
<td>0.207∗ (0.0607)</td>
<td>0.179 (0.0775)</td>
<td>0.250∗∗∗ (0.0665)</td>
<td>0.281∗∗ (0.120)</td>
</tr>
<tr>
<td>Safety Standards</td>
<td>-0.142∗ (0.0704)</td>
<td>-0.032 (0.123)</td>
<td>0.050 (0.0547)</td>
<td>0.209 (0.106)</td>
<td>-0.165∗ (0.0622)</td>
<td>-0.127 (0.126)</td>
</tr>
</tbody>
</table>
We study how the overall rankings of airlines are affected by their service operations performance. Airlines interact with their passengers on a number of dimensions such as flight attendants (language skills, attitudes, and appearances), physical items (seats, meals, inflight entertainment system, magazines, blankets, and pillows), and airport operations (check-in, arrival and transfer services, and lounge management). We find that response to customer requests, high cabin presence, good quality in-flight products, and well-designed check-in operations have significant positive effects. Interestingly, some items are worsening the image of the airline such as safety standards.

REFERENCES

References available upon request.